become high enough in order to set up the essential reactions typical of the basic open-hearth process, namely the transference of large quantities of iron silicates and phosphates into the corresponding limesalts and the reduction of iron protoxide set free to metallic iron. If the slag was allowed to run out of the furnace before the ending of the last-named reactions, the reducing agents were removed out of the iron, but their products of elimination were removed in a form which did not permit of the using up of the iron content of the ore. One had almost completely allowed this iron content to go to loss, and on the other hand attained a loss of charge which is approximately equal to the sum of all reducing agents in the pig iron.

But if the ore addition has not been exactly adjusted, some further defects manifest themselves. If it be too small, the motal after melting down contains more carbon than usual in the pig and scrap process, and under the influence of iron ore additions it effervesces; it forms considerable new quantities of slag, and the finishing of the "heat" is much prolonged.

If prr contra the ore addition be too large, the metal bocom os so HO ft that it admits of being melted with difficulty, and Hum much pig iron must be added afterwards, often causing trouble onough even to bring the charge out of the furnace.

To achieve the avoidance of the evils on melting clown and to produce in addition favourable utilisation of the ore additions, even in that case it gives rise to larger absolute heat requirement than in necessary for the pig and scrap process. This surplus requirement admits of being estimated for each given charge', from the figures previously ascertained. For example, were a pig iron employed with 1 per cent. Si, 0*5 per cent. P, 2 per cent. Mn, and 4 per cent. G, of which during melting down there would be eliminated by the oxidising action of the furnace, say 0*8 per cent. Si, 0'2 per cent. P, Q-f> per cent. Mn and 1"2 per cent. 0, there would remain for removal by means of the oxidising action of the furnace and ore, up to finishing, O7 per cent. Si, 0'8 per cent. P, 1*4 per cent. Mn, and 2-8 per cent. C.

B.S. "

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